



Case report

Pistol thrown to the ground by shooter after fatal self inflicted gunshot wound to the chest

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ABSTRACT

We report the case of a 46-year-old man found dead in his apartment in a chair with a gunshot wound in his chest. All circumstances pointed to suicide as the manner of death. Finding the weapon, a SIG Sauer P228 pistol, about 2 m away from the decedent with an obstacle between weapon and corpse however generated speculation about third party involvement. Scene investigations and ballistic calculations showed that with a high probability the weapon must have been purposefully thrown away by the decedent after he fired the lethal gunshot.

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1. Case history

A 46-year-old man was found dead in his apartment with a gunshot wound to his chest. He was sitting in a chair in front of a running television, which was placed on a small table. Behind the television, about two meters away from the decedent, a pistol was found on the wooden parquet floor surrounded by several electric cables. Under the chair, there was a large amount of dried blood. 40 centimetres behind the chair, a one centimetre diameter hole (containing the bullet slug) in the wooden parquet floor was discovered. In the same room, a suicide note was found. The apartment door was locked and the key inserted from the inside. After removing the corpse from the chair, a wound in the back showing characteristics of an exit gunshot wound (apposing wound edges, no margin of abrasion, no gunshot residues) was discovered. The chair had a small defect on the front and back sites of the backrest. The apartment was untidy but showed no traces of forced entry or altercation.

The bare-footed decedent wore a t-shirt, sports trousers, pants and ear protectors over his ears. The t-shirt showed defects with dried bloodstains on the front and back corresponding to the location of entrance and exit of a gunshot wound.

The pistol found was a SIG Sauer P228 in good condition. In the firing chamber, an empty case was discovered. The pistol hammer was cocked. Three bullets (9 mm Luger Geco soft-point) were loaded in the magazine inside the pistol.

The man suffered from Borderline personality disorder and was reported to have attempted suicide before.

Forensic external examination of the body revealed a gunshot entrance wound (oval shaped defect with a circumferential margin of abrasion surrounding the defect, soot has deposited around the wound) in the left chest (Fig. 3) and an exit wound in the left back.

The exit wound at the back corresponded to the location of the small defect on the front of the chair backrest. No further injuries on the body were observed. Time of death was estimated to be about 3–6 days before examination. Gunpowder residues were also found on the left hand of the decedent. It is not known if the man was left handed or right handed. As a third party involvement could be excluded by the locked situation of the flat, the district attorney refrained from commissioning an autopsy.

2. Recoil and possible trajectory of the weapon

The known physical laws of conservation of momentum and energy can calculate the recoil of a weapon. The recoil of the gunshot is composed of the momentum of the bullet and the gas flow in the barrel behind the bullet by the momentum of the gas

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flow through the muzzle. With the known bullet and powder mass and the approximate muzzle velocity the recoil momentum can be determined. Together with the weapon mass, the recoil energy of the weapon and its velocity can be calculated. Mass and velocity are the initial values for the calculation of possible weapon trajectories after the gunshot using ballistics software.¹

We calculated the trajectory of the weapon. Neither the trajectory with the maximal possible distance nor the one with a high enough apex to clear the TV could reach the place where the pistol was found.

3. Discussion

While most facts of the case pointed to suicide, the location of the weapon was anomalous and could not be easily explained. Four possible scenarios were considered. 1. The decedent fired the shot and by recoil, the pistol flew backwards and then slid a certain distance on the door. 2. A third party moved the pistol or even fired the deadly shot. 3. The decedent fired the shot at the location where the weapon was found, dropped it to the ground and moved into the final position in the chair. 4. The decedent threw the gun away after he fired the shot.

1. Considering the morphology of the entrance wound and the defect on the t-shirt at the front the shot was fired close to the chest.^{2–4} Our calculations showed by its own recoil the used SIG Sauer pistol, operated with the Geco 9 mm soft-point ammunition could neither cover the distance between the chest of the corpse and the final position of the pistol nor fly high enough over the television (Fig. 1, yellow line).^{1,5,6} (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article). Furthermore,



Fig. 2. Pistol on the ground between electric cables.

a sliding of the weapon under the small TV-table after it hit the ground can be excluded, as the weapon was surrounded by several electric cables placed on the ground (Fig. 2). A straight flexible electric cable on the ground between the decedent and the weapon proves the weapon cannot have glided on the ground for it would have touched and bended the cable there (Fig. 1, purple line) (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article).

2. Except for the location of the weapon no other clues to support homicide or actions of a third party at the scene were found.

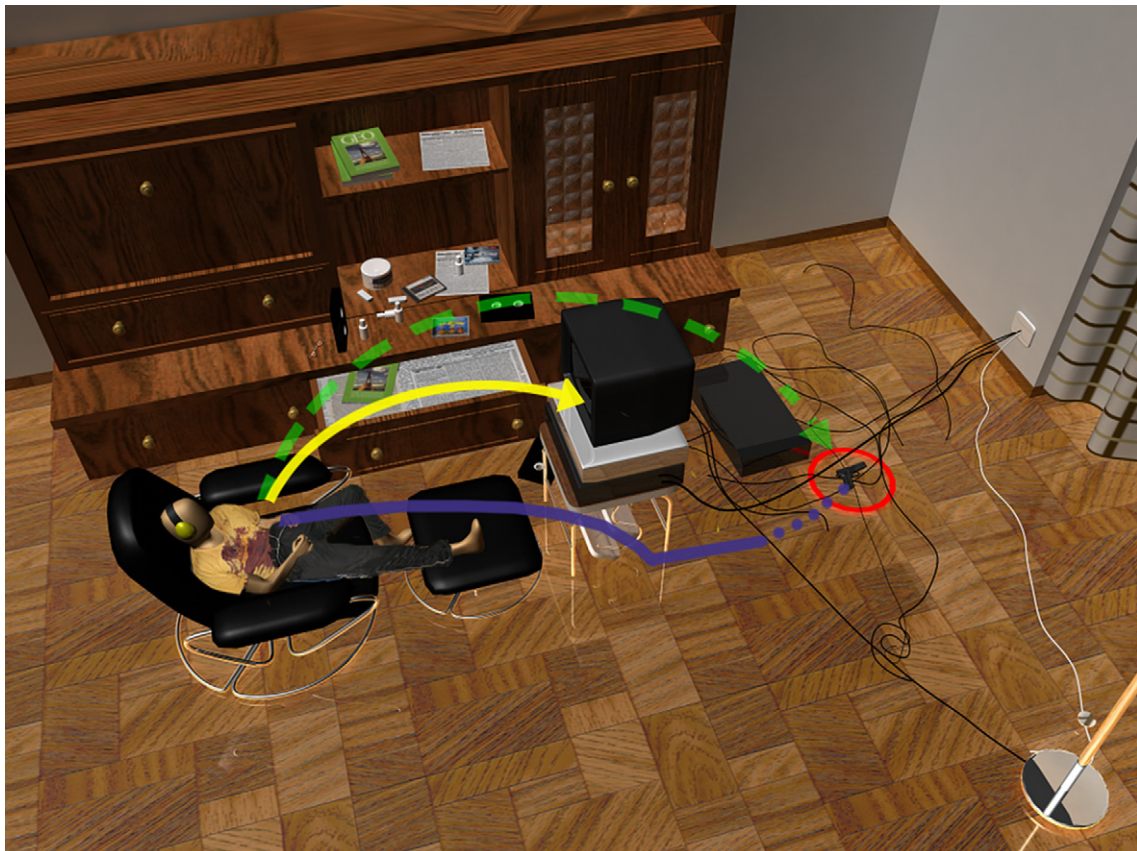


Fig. 1. Digital graphic depicting the scenario (room dimensions and recoil trajectory not to scale).



Fig. 3. Gunshot entrance wound in the left chest.

The apartment door and windows were locked from the inside. A suicide note was found near the corpse. The decedent was known to suffer from Borderline personality disorder (which includes increased suicidal tendency) and had attempted suicide before.⁷ Interestingly the decedent was wearing ear protection, presumably to avoid being startled by the noise of the weapon discharge. To our knowledge this is the first reported case of hearing protection use during suicide. Finally smoke residue was found on the decedent's left hand, pointing to him as the actual shooter.⁸

3. There was only one empty cartridge and one fired bullet slug found. The empty case was jammed in the pistol chamber. The fired bullet slug was discovered in a small hole in the wooden floor directly behind the chair in which the decedent was seated. As the exit wound on the back was roughly 10 cm lower than the entrance wound on the chest, the bullet course through the chest must have been slightly descending.^{2,5} The two holes at the front and the back of the backrest as well as the hole in the wooden floor were aligned with the entrance and exit wounds in the victim. Since only one cartridge was fired the decedent must have been sitting in the chair while this shot was fired and penetrated his chest and back, as well as the backrest of the chair and the wooden floor. Therefore the gunshot was not fired at the final position of the pistol.
4. The weapon was found with a cocked hammer. Usually when a SIG Sauer Pistol of this kind is fired, the hammer is cocked automatically after every shot by the reloading mechanism of the bolt action. Hence a jammed cartridge was found in the pistol chamber. If a cartridge is jammed in the chamber after a fired shot the hammer is not cocked automatically. The

reloading action may have been impeded because the decedent partially fixed the slide with his left hand (which could explain the gunshot residues there) and the hammer could not be cocked. Therefore the hammer must have been cocked manually by the decedent after he fired the shot. This would require that the decedent was not suddenly unconscious or dead after he fired the shot. Since there was no autopsy or post mortem imaging performed we can only speculate there was a lethal damage to the heart or lung or other vitally important chest structures. Cases of lethal chest shots which were survived consciously for seconds to several minutes are described in literature.^{9,10} After the shot did not lead to sudden death the decedent must have decided to fire another shot. However that was impossible because of the non-reloaded weapon. Cocking the hammer manually and trying to fire another shot was technically impossible and the weapon was very probably tossed to the ground (Fig. 1, green line). On the floor nearby the pistol there were no signs of an impact such as scratches or other damages. This however does not exclude the weapon was thrown (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article).

4. Conclusion

A weapon found rather a long distance away from a (shot) dead body does not automatically exclude suicide. Although the possibility of homicide should be considered our case demonstrates there are several other possible explanations. A careful examination of the incident scene combined with ballistic analysis brought clarity. The use of hearing protections is a rare and interesting finding in this case and is illustrating the varied means and methods used for suicide.

Conflict of interest

None declared.

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Ethical approval

None declared.

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